CLAIMS

1. A pump providing a chamber having a volume, an inlet to the chamber, an outlet from the chamber, and means for varying the volume of the chamber.

2. A pump as claimed in claim 1, wherein the pump is adapted to be used downhole such as in an oil/gas well.

3. A pump as claimed in either of claims 1 or 2, wherein the means for varying the volume of the chamber is controlled by relative rotation of first and second bodies of the pump.

4. A pump as claimed in claim 3, wherein the second body is provided within the first body.

5. A pump as claimed in claim 4, wherein the first and second bodies are substantially concentric one with the other.

6. A pump as claimed in claim 4, wherein the first and second bodies are substantially eccentric relative to one another.

7. A pump as claimed in any of claims 3 to 6, wherein the chamber is provided within the second body.

8. A pump as claimed in claim 7, wherein the chamber is provided substantially longitudinally within the second body.

9. A pump as claimed in any of claims 3 to 8, wherein the first and second bodies are each of an elongate form.

10. A pump as claimed in any of claims 3 to 9, wherein the second body comprises a rotor.

11. A pump as claimed in claim 10, wherein the first body comprises a stator.

12. A pump as claimed in claim 11, wherein the means for varying the volume of the chamber includes at least one piston supported by the second body and biased by means towards the first body.

13. A pump as claimed in claim 12, wherein a first end of the/each piston communicates with the chamber and a second end of the/each piston is urged by biassing means into contact with an inner surface of the stator.

14. A pump as claimed in claim 13, wherein relative rotation of the first and second bodies causes movement of the piston(s) thereby varying the volume of the chamber.

15. A pump as claimed in claim 4, wherein the first body has a substantially elliptical or oval internal bore.

16. A pump as claimed in claim 15, wherein the second body is provided with a substantially cylindrical or elliptical outer surface.

17. A pump as claimed in claim 4, wherein the first body has a substantially cylindrical internal bore.

18. A pump as claimed in claim 17, wherein the second body is provided with a substantially elliptical outer surface.

19. A pump as claimed in claim 18, wherein the means for varying the volume of the chamber includes at least one piston supported by the first body and biased by means towards the second body.

20. A pump as claimed in claim 6, wherein the first body has a substantially cylindrical internal bore.

21. A pump as claimed in claim 20, wherein the second body is provided with a substantially cylindrical outer surface.

22. A pump as claimed in any of claims 1 to 21, wherein the inlet includes a first one-way valve.

23. A pump as claimed in claim 22, wherein the inlet also includes one or more back-up valves.

24. A pump as claimed in any of claims 1 to 23, wherein the outlet includes a second one-way valve.

25. A pump as claimed in claim 24, wherein the outlet also includes one or more back-up valves.

26. A pump as claimed in any of claims 12 to 14, wherein there is provided at least one pair of pistons supported by the second body and radially opposing one another relative thereto.

27. A pump as claimed in claim 26, wherein the at least one pair of piston is provided substantially within the second body.

28. A pump as claimed in either of claims 26 or 27, wherein there are provided a plurality of pair of pistons, each pair being longitudinally spaced from an adjacent pair along the second body.

29. A pump as claimed in any of claims 12 to 14 or claims 26 to 28, wherein the/each piston includes a rotatable member free to rotate at least along a longitudinal axis with respect to the rotor.

30. A pump as claimed in any of claims 12 to 14 or claims 26 to 29, wherein the/each piston includes a piston member.

31. A pump as claimed in claim 30, wherein the piston member includes a concave portion capable of receiving at least a portion of the rotatable member.

32. A pump as claimed in claim 31, wherein each rotatable member is in the form of a sphere.

33. A pump as claimed in claim 31, wherein each rotatable member is in the form of a cylinder.

34. A pump as claimed in any of claims 1 to 33, wherein the means for varying the volume of the chamber is driven by drive means.

35. A pump as claimed in claim 34, wherein the drive means includes a drive shaft for rotating the rotor, in use.

36. A pump as claimed in claim 11, wherein the rotor is provided with at least one seal or bushing for sealing engagement with the stator.

37. A pump as claimed in claim 36, wherein the/each seal is/are made from a material selected from the group consisting of plastics materials, polyethylethylketone, metal, copper alloys and stainless steel.

38. A pump as claimed in claim 30, wherein the piston member(s) is/are made from a material selected from the group consisting of plastics materials, polyethylethylketone, metal, copper alloys and stainless steel.

39. A pump as claimed in claim 12, wherein the piston(s) is hollow, spherical, cylindrical, cuboid or polygonal.

40. A pump as claimed in claim 29, wherein the rotatable member(s) is/are made from a material selected from the group consisting of plastics materials, polyethylethylketone, metal, copper, alloys and stainless steel.

41. A pump as claimed in claim 29, wherein the rotatable member(s) is hollow, spherical or cylindrical.

42. A pump as claimed in claim 13, wherein the/each biassing means is/are made from a material selected from the group consisting of plastics materials, polyethylethylketone, metal, copper alloys and stainless steel.

43. A pump as claimed in claim 10 or 11, wherein the rotor is provided with at least two piston apertures which are disposed substantially opposite one another, each of the piston apertures being provided with a respective piston.

44. A pump as claimed in claim 43 when dependent upon claim 11, wherein each piston has a slot, hole or gap to allow fluid to flow through the piston from the chamber, which fluid flow assists in lubricating contacting surfaces of the piston(s) and the stator and the piston(s) and the rotor.

45. A pump as claimed in claim 1, wherein the pump comprises or includes a plurality pistons and respective biassing means, wherein each piston and biassing means works individually in series or in parallel with one another.

46. A pump as claimed in claim 44, wherein the rotor is provided with a plurality of pistons arranged in pairs, each aperture of each pair being substantially opposite to the other.

47. A pump as claimed in claim 46, wherein one biassing means is used for each piston of a pair by traversing the chamber but not cutting off fluid flow through the chamber.

48. A pump as claimed in claim 1, wherein one or more one valves are used for the inlet of the pump and one or more one way valves are used for the outlet of the pump allowing fluid flow to travel through the chamber.

49. A plurality of pumps according any of claims 1 to 48, so arranged as to be operatively connected with one another.

50. A plurality of pumps as claimed in claim 49, wherein the pumps operate substantially in phase with one another and are not separated by a one-way valve(s).

51. A plurality of pumps as claimed in claim 49, wherein the pumps are arranged so that, in use, the pumps operate out of phase with one another.

52. A plurality of pumps as claimed in claim 51, wherein two pumps with two chambers are each connected 90 degrees out of phase with one another.

53. A plurality of pumps as claimed in claim 48, wherein two pumps each with four chambers are connected 45 degrees out of phase.

54. A pump as claimed in any of claims 1 to 47, wherein at least one first vent hole is provided at a predetermined position through the stator, allowing any pressure differential across the stator to be equalised, and held to the pressure external to the pump.

55. A pump as claimed in claim 54, wherein the rotor is provided within at least one bearing pack which includes at least one radial bearing and at least one thrust bearing.

56. A pump as claimed in claim 55, wherein the bearing pack includes at least one seal at a fluid upstream end and at least one seal at a fluid downstream section end of the bearing pack(s).

57. A pump as claimed in claim 55, wherein at least one second vent hole is provided at a predetermined position through a bearing housing, allowing any pressure differential across the bearing pack(s)to be equalised, and held to the pressure external to the pump.

58. A pump as claimed in claim 10, wherein the rotor is connected to a drive by means of a spline, hex, polygon or other similar coupling.

59. A well completion including at least one pump, the at least one pump providing a chamber having a volume, an inlet to the chamber, and an outlet from the chamber, and means for varying the volume of the chamber.

60. A method of artificial lift within an oil/gas well comprising the steps of:

lowering a pump to a desired position within a borehole of a well, the pump providing a chamber

having a volume, an inlet to the chamber, an outlet from the chamber and means for varying the volume of the chamber;

driving the pump so varying the volume of the chamber thereby pumping well fluids downstream through the pump and a tubing of the well.

61. A pump including an inlet, a filter means associated with the inlet, and means for cleaning the filter means.

62. A pump as claimed in claim 61, wherein the filter means comprises a substantially cylindrical body.

63. A pump as claimed in either of claims 61 or 62, wherein the filter means carries an end plate.

64. A pump as claimed in any of claims 61 to 63, wherein the filter means is formed from a sheet form mesh material.

65. A pump as claimed in any of claims 61 to 64, wherein the means for cleaning the filter means is driven by means by which the pump is driven.

66. A pump as claimed in any of claims 61 to 65, wherein the pump provides a chamber having a volume, an inlet communicating with the chamber, and further an outlet from the chamber, and means for varying the volume of the chamber.

67. A pump as claimed in claim 66, wherein the means for varying the volume of the chamber is controlled by relative rotation of first and second bodies of the pump.

68. A pump as claimed in claim 67, wherein the first and second bodies comprise a stator and a rotor, respectively.

69. A pump as claimed in claim 68, wherein the filter means is rigidly attached to the rotor so as to rotate therewith.

70. A pump as claimed in any of claims 61 to 69, wherein the means for cleaning comprise at least one blade, knife or scraper substantially rigidly attached to the stator.

71. A pump as claimed in claim 70, wherein the blade(s) has a serrated edge or surface which, when coming into contact with the filter means, in use, act to allow any debris or contamination build up on the filter means to be removed.

72. A pump as claimed in any of claims 61 to 71, wherein the filter means is/are made from a material selected from the group consisting of plastics materials, polyethylethylketone, metal, copper alloys and stainless steel.

73. A pump as claimed in either of claims 70 or 71, wherein the blade(s) is/are made from a material selected from the group consisting of plastics materials, polyethylethylketone, metal, copper alloys and stainless steel.

74. A pump as hereinbefore described with reference to Figs. 1 and 2 and to Figures 4 and 5.

75. An assembly of a plurality of pumps so arranged as to be operatively connected together as hereinbefore described.

76. A well completion as hereinbefore described with reference to Figure 3.

77. A method of artificial lift within an oil/gas well as hereinbefore described with reference to Fig. 3.